



## MASTER FILE

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### DSSD CENSUS 2000 PROCEDURES AND OPERATIONS MEMORANDUM SERIES # G-17

MEMORANDUM FOR Michael Longini  
Chief, Decennial Systems and Contract  
Management Office

Attention: Decennial Design, Policy and Management Branch

Through: Howard Hogan *Howard Hogan*  
Chief, Decennial Statistical Studies Division

From: Joseph D. Conklin  
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Subject: Trip Report to Communicolor in Hebron, OH

#### I. INTRODUCTION

To understand first hand the quality assurance activities being implemented for printing and to obtain a tour of the plant, the Communicolor and Morrow-Macke plants in Hebron, OH, were visited on October 25 and 26, 1999. This Communicolor plant is currently printing the short form mailout/mailback questionnaire. The Morrow-Macke plant is performing the insertion of the short form into packages.

The plants are located in central Ohio approximately 30 miles west of Columbus, OH. They are housed in separate buildings in an industrial park towards the outer limits of Hebron. There were several evidences of attention to quality and safety.

Lighting and housekeeping were more than adequate. The visitor walking zone was clearly marked. Explanations of the procedures on how to handle hazardous materials, take shelter from hurricanes, and protect one's hearing were clearly posted.

The Communicolor plant displayed current productivity and quality indicators in easy view of the floor. The goals of the Material Quality Improvement Team were also displayed. A system exists by which workers may nominate their peers who demonstrate exemplary work practices. The tour was conducted in a very thorough manner.

Points of contact were government-on-site monitors from the Government Printing Office (GPO) and Decennial Systems and Contract Management Office (DSCMO) as well as the Communicolor and Morrow-Macke representatives for the forms contracts.

## II. COMMENTS

### A. Communicolor Personnel Comments

The contract representative explained the printing process during the tour. This plant has single web and double web presses. On the tour, the short form was being produced on a double web press.

The printing steps consist of (1) unwind paper from roll, (2) feed paper through torsion rollers, (3) adjust torsion as needed to maintain tension on paper, (4) maintain constant climate control, (4) apply ink to both sides of sheet, (5) heat paper through oven to dry ink, (6) reinsert moisture to prevent brittleness, and (7) run forms on take up roll.

The imaging steps consist of (1) unwind paper from roll, (2) apply address to forms on line, (3) apply bar codes to forms on line, (4) fold forms, (5) cut forms, and (6) stock forms in boxes for shipping to Morrow-Macke for insertion. Across all lines, an average of 22,000 forms are imaged and folded per hour.

The contract representative explained that two forms are pulled from every line every half hour. The plant has experienced no problems keeping up with the sampling schedule or in documenting the samples that are sent to the National Processing Center (NPC). The Internet screen for entering daily production totals is easy to use. The contract representative was asked if there were improvements to suggest for the screen. None were made.

In addition to the printing and imaging processes, the platemaking process was also explained. A plate is required before printing can occur. Making a plate requires acquiring an image, either on film or computer file, matching the color, and transferring the image to a plate. Technology is moving to the complete use of computer files to transmit images.

Samples are measured on the production line with the spectrophotometer. Communicolor personnel received one on one training on how to use the spectrophotometer and the PrintSample computer program, which is used to enter quality measurements. The PrintSample program is very easy to use. There are many screens that do not apply to what the personnel measure. Clicking through all these screens to complete an inspection slows down the process. It would be helpful if the screen customized itself to only the fields which a particular person had to enter at a given time.

## B. Morrow-Macke Personnel Comments

The contract representative explained the inserting process during the tour. Two types of inserters are used. For envelopes with no plastic over the address window, mechanical inserters are used. The envelope is held open with a mechanical arm as the questionnaire, letter, and return envelope is inserted. An average of 1200 envelopes per hour can be inserted with these machines.

A second type of inserter relies on forced air to hold the envelope open. This type of inserter requires a cover over the address window so the air does not escape out of the envelope. Seven of this type of inserter are dedicated to Census 2000 business. Each of these machines is capable of inserting an average of 14,000 envelopes per hour.

The inserting steps consist of (1) load questionnaires, letters, and envelopes in their stacking towers; (2) pick up outgoing envelope; (3) open outgoing envelope by mechanical arm or forced air; (4) move questionnaire, letter, and return envelope into outgoing envelope; (5) apply moisture to flap of outgoing envelope; (6) seal outgoing envelope; (6) collect required inspection samples; and (7) stack packages for mailing.

Before a new type of package comes to inserting, the inserting machine requires set up. Set ups average two to three hours. A mock package is used to verify the calibration of the measurements, especially for the pockets of the envelope.

Few quality concerns have arisen at the inserting plant. The contract representative noted a few packages were spotted with insufficient moisture on the flap. This is a very rare occurrence. The same inspection procedure is used for Census 2000 packages as for other business the plant performs. Inspection is at a reduced frequency on other than Census 2000 work.

Two samples are pulled once per hour from each inserter that is running. One sample is inspected at the plant. The other is sent to NPC. The inspection requirements for Census 2000 business have resulted in the hiring of personnel dedicated to this purpose. The samples are checked for sealing, the proper package type, whether the correct items are in the package, and whether the address is visible.

The PrintSample software is easy to use. The plant personnel were given one on one training on how to run PrintSample. The contract representative said he would prefer screens customized to exactly what the inspectors were looking for. Clicking through all the screens that are not necessary to the inspectors' job slows things down.

The inserting plant has experienced more troubles transmitting data than in entering it. The Internet system used by the plant frequently times out before the transmission is completed. As a result, the same transmission frequently must be reattempted several times. A representative from the DSCMO was on hand during the tour to help with transmission. Some of the problems appear to be coming from the Internet

service provider's set up for the inserting plant. The need to retransmit the same file can be reduced but complete elimination appears unlikely at this point.

### C. Census Bureau and GPO Comments

A representative from the Census Bureau arrived at Communicolor and Morrow-Macke to help with the transmission problems described above. This person's visit was arranged independently of the tour but occurred at the same time as the tour. This representative did not offer comments outside of explanations for the transmission problems. These have already been mentioned.

The onsite monitor from the Census Bureau worked the evening shift during the tour and visit. She was not available for comments because the attempts to mesh schedules were not successful.

The onsite monitor from the GPO was available and offered several comments. The day of the tour the monitor was working at Communicolor after spending the prior week at Morrow-Macke. The GPO representative gave us a demonstration of the instruments that he uses to determine if a batch of printed questionnaires have met printing specifications. The instruments are: a densitometer, a spectrophotometer, a bar code reader, and a template. The instrument that gives trainees the most problems is the densitometer.

Every 45 minutes, sample questionnaires are drawn and checked for density, color, and readability of the various bar codes. The readings are all captured on computer as is the decision regarding the acceptance or rejection of a sample questionnaire. The template is used to check if a questionnaire's fields fall within the specified tolerance.

When asked about quality concerns, two were brought up. At Morrow-Macke, a problem was found in which the envelope flap was covering the address window. The management responded within an hour. The operators began a purge of the defective envelopes. The manager completed the purge by going through the entire palette and inspecting 100 percent of the contents.

One of the technicians shared information on an equipment adjustment that corrected the defect. The GPO monitor did not know if the cause of the defect was discovered or if the equipment adjustment triggered a revision to Morrow-Macke's quality procedures.

Another quality issue related to the moistening of the envelope flaps. One of the envelopes in an inspection sample did not have the adhesive moistened all the way across the edge. This problem was found on an envelope without a cover over the address window. To watch for this problem, the operators at Morrow-Macke take off samples and fan through them to check the completeness of the adhesive. The GPO monitor witnessed the operators performing this check. No other comments were made about the performance of the operators at Morrow-Macke. The GPO monitor noticed no major difficulties in the plants' ability to change shifts

smoothly. Each shift start involves some set up time as the operators implement their preferred equipment settings. The monitor did not verify whether problems were regularly communicated between shifts.

With regard to the PrintSample program, the GPO monitor said that it was very user friendly. Training for PrintSample had been in August during the one week session at GPO. There was enough time for questions and answers during the training.

The GPO monitor presently has no difficulty using the densitometer, spectrophotometer, or the bar code reader. If more help were needed, the GPO monitor would consult the more experienced GPO or Census Bureau users who are available for this purpose. Possible improvements to PrintSample are suppressing the color screens when only visual attributes are being checked.

The GPO monitor did not recall any comments from Communicolor or Morrow-Macke regarding the PrintSample software or the measuring equipment. The monitor inspects one sample every hour. There is no problem keeping up with the sampling schedule. A log of samples shipped to NPC is maintained by Communicolor and Morrow-Macke.

### III. CONCLUSIONS

Communicolor and Morrow-Macke are well run plants who by and large are effectively implementing the procedures required for meeting quality requirements. In the future, it would be helpful if the onsite monitors confirm whether problems such as the flaps covering the address window result in a root cause analysis and consideration of a revision to the plants' problem resolution procedures. This practice would increase the companies' institutional memory for problem solving.

Although the level of quality concerns is low, another helpful check for the future is some investigation into how well problems are communicated between shifts. For future contracts, the supplier might be required to provide periodic examples of pass down reports between shifts.

As mentioned in a prior report, the next generation of PrintSample should include more options to customizing the appearance of the data screens. Restricting the screens as much as possible to what a particular station should enter ought to increase the acceptance of the software even further than it now is.

To the extent a supplier has flexibility in how they log on to the Internet, it would be helpful to provide future suppliers with a standard protocol which has a high probability of complete, error free transmission in one attempt.

The climate control at Communicolor substantially contributes to keeping the forms in good condition while they are stored in the plant warehouse. Consideration should be given to requiring future suppliers of critical forms to have climate control capabilities.

cc:

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